Space Weather Forecast

Issued on Tuesday, 16 January 2024 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is at Low levels, with only common class activity recorded. There are currently twelve sunspots on the visible disc, three of which remains unnumbered. The complex area in the southwest has seen some simplification over the last 24 hours, with the number of spots in the intermediate region appearing to decrease although likely in some part a function of the increasingly oblique viewing angle. The region in the center southeast disk still consists of a large leader spot, with the region as a whole continuing to display some magnetic complexity. The recently numbered region in the southeast continues to rotate onto the disk. Full analysis of this spot remains difficult due to foreshortening. All other regions appear to be stable, or in decay.

No coronal mass ejections (CMEs) observable on coronagraph imagery over the past 24 hours are expected to have an Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar wind parameters, as observed by DSCOVR at L1, have been at generally background levels. Solar wind speeds assessed as slow/ambient. The interplanetary magnetic field (IMF), Bt, has been weak with only a brief moderate peak. The north-south component was weak and mostly negative. Geomagnetic activity was mostly Quiet (Kp 0-2) with a brief interlude into unsettled (Kp3) 16/0000-0300.

Energetic Particles / Solar Radiation: Solar radiation was at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of isolated Moderate-class activity and a very slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections currently feature in the forecast.

Higher solar winds, with potential speeds of 450-500 km/s, expected to influence the near Earth environment day 1 (16 Jan) into day 2 (17 Jan), with the effects waning into the period and just the small chance of further fast wind influence by the end of day 4 (19 Jan).

Overall, geomagnetic activity is likely to be Quiet (Kp 0-2), but with a chance of Unsettled to Active (Kp 3-4) intervals days 1 or 2 (16-17 Jan) should we see faster solar winds, with this risk returning into day 4 (19 Jan).

Energetic Particles / Solar Radiation: Solar radiation is expected to persist at background levels. Although, there remains an ongoing slight chance of seeing an increase to the S1/Minor Radiation Storm threshold should any notable flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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